Gulf of Maine Council-NOAA Habitat Restoration Partnership
Grantee Reporting Template

Insert an "X" for report type: ___Progress Report _X_Final Report

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NOTE: Instructions are provided at the end of this report template.

1. General information

GOMC-NOAA project number and title: 09-01 Maxwell Pond Dam Removal and Restoration Project
Grantee organization: City of Manchester,NH - Division of Parks, Recreation and Cemeteries
Report submitted by: Peter D. Capano, Parks Chief, (603) 624-6565, pcapano@manchesternh.gov
Reporting period: 01/01/2011 – 06/30/2011
Date report uploaded: 07/21/2011

Project location, as appropriate to the project type:
Town(s): Manchester
County(ies): Hillsborough
State/province: NH
Water body (e.g. Egypt Bay): Black Brook/Merrimack River
Lat/Lon coordinates in degrees: Lat 43.010278 Lon 71.478889

2. Tasking and products (insert an "x" here _x__ to indicate a revision to your latest tasking and products timeline)

Task 1: Hold pre-construction meeting & initiate mobilization
Start date: 02/04/09 End Date: 02/11/09
Progress for this reporting period: Completed 02/05/09

See Progress Report for 02-01-2009 to 06-30-2009

Task 2: Relocate utilities, install construction access, and install cofferdam
Start date: 02/13/09 End date: 03/13/09
Progress for this reporting period: Completed 03/11/09

See Progress Report for 02-01-2009 to 06-30-2009

Task 3: Remove concrete walls and concrete/masonry sluice gate structure
Start date: 03/16/09 End date: 03/18/09
Progress for this reporting period: Completed 03/03/09

See Progress Report for 02-01-2009 to 06-30-2009

Task 4: Remove the dam spillway and remaining concrete walls
Start date: 03/19/09 End date: 04/02/09
Progress for this reporting period: Completed 03/13/09

See Progress Report for 02-01-2009 to 06-30-2009

Task 5: Remove and/or cut down stone masonry walls downstream of spillway
Start date: 04/03/09 End date: 04/17/09
Progress for this reporting period: Completed 03/13/09.

See Progress Report for 02-01-2009 to 06-30-2009
Task 6: Remove cofferdam, fine grade entire area, install winter erosion control matting and fencing
Start date: 04/20/09 End date: 04/24/09
Progress for this reporting period: Completed 04/24/09

See Progress Report for 02-01-2009 to 06-30-2009

Task 7: Vegetate with specified seed, plants, shrubs, and trees
Start date: 04/27/09 End date: 06/30/09
Progress for this reporting period: Completed 04/30/09

See Progress Report for 02-01-2009 to 06-30-2009

Task 8: Conduct post-construction GOMC Barrier Removal Monitoring Protocol and Volunteer River Assessment Program (VRAP) assessments
Start date: 06/01/09 End date: 07/31/2010
Progress for this reporting period: COMPLETE

The specific protocols and VRAP assessments implemented during the current reporting period are as follows:

Longitudinal Profiles and Channel Cross Sections: Channel width, depth, slope and planform measurements were taken along the longitudinal profiles and channel cross sections of the newly restored Black Brook most recently in the fall of 2011. Raw data from these surveys has been received and is being stored by the NHDES Dam Bureau. The Plots of the survey have not been developed due to the lack of resources within NHDES. NHDES continues to monitor the channel evolution of the project through site visits and photographic documentation. Attachments of raw data are included with this report

Fish Community Assessments: Fish counts were performed both pre-and post removal. Pre-removal fish community assessments have documented the baseline condition in both Black Brook and Maxwell Pond since 2002 when these surveys were initiated. The most recent fish community survey was conducted on July 27, 2010. A chart of the fish counts is included with this report. Once all data is received, trends will be analyzed and included in the project's final report.

Grain Size Distribution (Pebble Counts): Analyses of the streambed materials within Black Brook and Maxwell Pond have been accomplished through the implementation of grain size distribution sampling protocols at several channel cross-sectional transects established within the project area. Personnel from the DES Watershed Assistance Section conducted both the pre-removal and post-removal collections of the field data required to calculate cumulative frequency curves for each transect sampled in the project area. By employing grain size distribution sampling in the project area, an evaluation of streambed composition pre and post-dam removal is possible. Employing these protocols also allows for monitoring channel evolution as Black Brook responds to the dam removal and changes in slope, sediment supply, and available floodplain. Although pre- and post-pebble counts have been conducted and the data is stored at DES, the cumulative frequency curves

have not been generated at this time. The raw data from pebble counts conducted within the project are included with this report.

Water Quality and NH VLAP and VRAP: The EPA has received enough data to officially remove Maxwell Pond/Black Brook from 303(d) list of impaired waterways. Additional data is included with this report showing the water quality sampling results from both pre- and post-dam removal.

Photo Stations: Photos were taken from the pre-determined locations during the summer and fall of 2010. Instructions for accessing the photo documentation of the site are included with this report.

Riparian Plant Community Structure: At least one vegetation monitoring station was established within each distinct vegetation cover type along each transect during pre-restoration conditions. A minimum of four to a maximum of eleven sampling plots have been established for each of the four transects established within the project area. Pre-restoration plant community surveys were completed during a two day sampling effort in July of 2008. The post-restoration plant community surveys were completed during a similar two day effort in July of 2009 and in 2010 when plant communities are most abundant and flowering for ease of identification. Annual monitoring of plant communities within the project area will continue for the next five years and allow project managers to document the transition of various community structures, abundance, and diversity as Black Brook continues to evolve into a new planform within the fully restored impoundment area that was once Maxwell Pond.

Macroinvertebrates: Although a specific benthic macroinvertebrate community sampling methodology is not recommended within the GOMC Stream Barrier Removal Monitoring Guide, the Black Brook Restoration Project partners have consulted with the NHDES Biomonitoring Program since 2002 for guidance in collecting community data for these excellent indicators of stream health. Several years of community data have been collected to document pre-restoration conditions at these two locations. During the summer of 2009, the first post-restoration rock basket deployments were successful and once again conducted under the supervision of the DES Biomonitoring Program. Macroinvertebrate reporting will not occur for at least another year or two as subsequent sampling events are required to monitor trends in macroinvertebrate populations. The DES Biomonitoring Program is committed to continuing these assessments over then next five years.

Task 9: Hold press events and report
Start date: 02/01/09 End date: 11/5/2009
Progress Report for this reporting period: Completed 11/5/2009

See Progress Report for 6/30/2009 to 12/31/2009

Task 10: Field Data Collection
Start date: 07/01/10 End date: 7/14/10
Progress Report for this reporting period: Completed

Conduct a detailed site inspection to evaluate where bank stabilization measures should be installed. Conduct limited topographic survey including the left bank from the location of the former spillway to a point approximately 200 feet upstream.

Task 11: Preliminary Design
Begin date: 07/14/10 End date: 7/28/10

Progress Report for this reporting period: Completed

Create a new basemap of the site incorporating the information collected in Task 1. Design and prepare preliminary engineering drawings of bank stabilization measures. The drawings will include a typical cross section, a plan view showing upstream, downstream, and lateral limits of the proposed work, and location and general type of new plantings. Submit the plans in electronic format (PDF) to the City and project partners.

Task 12: Design Review
Begin date: 07/28/10 End date: 08/09/10
Progress Report for this reporting period: Completed

Coordinate an on-site design review meeting with project partners, and arrange a conference call to discuss the design with partners who are not able to attend the on-site meeting. The intent of the meeting and call is to get input from the partners on desired design refinements prior to finalizing the plans.

Task 13: Final Design
Begin date: 08/09/10 End date: 08/23/10
Progress Report for this reporting period: Completed

Incorporate comments on the preliminary design, refine planting plan, and prepare Final Plans.

Task 14: Permitting
Begin date: 08/09/10 End date: 08/23/10
Progress Report for this reporting period: Completed

Prepare an application to amend the project's existing NHDES wetland permit and submit to NHDES for approval.

Task 15: Selection of Contractor
Begin date: 08/23/10 End date: 09/23/10
Progress Report for this reporting period: Completed

Bid packages were received on August 8, 2011. The apparent low bidder was SumCo Eco Contractors, Inc. SumCo was officially awarded the bid on August 15, 2011.

Task 16: Construction
Begin date: 09/23/10 End date: 10/31/10
Progress Report for this reporting period: Completed

Construct the bank stabilization measures, install plantings suitable for late fall installation, and stabilize the site for winter shutdown. Includes part-time (24 hrs total) construction observation by engineer.

Task 17: Additional Plantings
Begin date: 05/15/11 End date: 06/30/11
Progress Report for this reporting period: Completed

The construction of the additional stabilization occurred during the fall planting season and all plants were installed in accordance with construction documents.

B. Products

Work product/deliverable 1: Pre-construction GOMC Barrier Removal Monitoring Protocols and Volunteer Lake Assessment Program (VLAP) data
Begin Date: 06/01/08 End date: 01/30/09 Status: COMPLETE

See Progress Report for 02-01-2009 to 06-30-2009

Work product/deliverable 2: Completed work orders by Fairpoint Communications and National Grid. All utilities relocated.
Begin date: 02/13/09 End date: 03/13/09 Status: COMPLETE

See Progress Report for 02-01-2009 to 06-30-2009

Work product/deliverable 3: Initial press event marking first breach of spillway, and Maxwell Pond/Black Brook Dam and associated infrastructure completely removed. Black Brook continuity restored with Merrimack River.
Begin date: 02/17/09 End date: 03/20/09 Status: COMPLETE

See Progress Report for 02-01-2009 to 06-30-2009

Work product/deliverable 4: Project area stabilized for winter conditions and contract for spring planting, seeding, and site stabilization executed between City of Manchester and contractor.
Begin Date: 04/20/09 End date: 06/22/09 Status: COMPLETE

See Progress Report for 02-01-2009 to 06-30-2009

Work product/deliverable 5: Post-construction GOMC Barrier Removal Monitoring Protocols and Volunteer River Assessment Program (VRAP) data
Begin date: 06/01/09 End date: 11/30/11 Status: In-progress

See Task 8 for the summary description of the work completed under Work product/deliverable 5.

Work product/deliverable 6: Post-construction press event
Begin Date: 07/01/09 End Date: 11/5/2009 Status COMPLETE

See Progress Report for 7-1-2009 to 12-31-2009

Work product/deliverable 7: Final report delivered to the Gulf of Maine Council
Begin Date: 10/01/09 End Date: 11/30/11 Status: COMPLETE

This submission is the final report for the project. This report includes raw data for GOMC monitoring protocols. Due to staff availability, processing of the raw data has been delayed considerably. Upon completion of the processing, the City of Manchester will forward the analysis to GOMC and other project partners for their project file records.

3. Regulatory approvals required for work directly supported by this grant

Permit/review type	Status: not applied, applied, or approved	Date of submittal or approval
Wetlands Permit – Original Project	Approved	Approved 1-20-2009
Wetlands Permit – Additional Stabilization	Approved	Approved 1-10-2011

4. Quantified accounting of habitat improvements

Habitat Type:	This reporting period	Cumulative for this grant	Total projected for this grant
Subtidal non-veg acres			
Subtidal eelgrass acres			
Intertidal non-veg acres			
Saltmarsh acres			
River/stream acres			
River/stream miles	0	7.7	7.7
Riparian acres			
Riparian miles			
Alewife spawning (lake) acres			
Other			

Additional comments:

5. Quantified accounting of volunteer involvement

	This reporting period	Cumulative for this grant	Total projected for this grant
Volunteer Numbers:	0	53	53
Volunteer Hours:	0	203.9	203.9

Additional comments:

6. List of documentation materials you include in the Final Report pdf file

a. Site Photo Documentation
b. Field Activity Photos
c. Press releases providing acknowledgement of this grant program
d. Project Invoices Paid (NHDES and SumCo Eco-Contracting, Inc.)
e. Match letter from National Grid indicating in-kind services and match amount.

7. List of products uploaded to your GOMC-NOAA Project Webpage separately from this report

a. Updated Fish Counts, Raw Data
b. Longitudinal Profiles and Cross-Sections, Raw Data
c. Pebble Counts, Raw Data
d. Instructions for accessing photo documentation of the project's progress
e. Final Design Plans for the Bank Stabilization
f. NHDES Standard Dredge and Fill Permit for Bank Stabilization

8. Budget information

A. Itemized Budget Table

B. Budget narrative:

Category / Item	GOMC-NOAA Partnership Grant						Other sources[2]		Total of all sources		Non-federal match details			
	GOMC-NOAA grant award		Non-fed match[1]		Total						Match		In-kind match[4]	
	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Source	Type[3]	$/hr	Hrs
Personnel														
insert items/rows					0	0			0	0				
Fringe														
insert items/rows					0	0			0	0				
Travel														
insert items/rows					0	0			0	0				
Equipment														
insert items/rows					0	0			0	0				
Supplies														
insert items/rows					0	0			0	0				
Contractual	64000		121000		185,000		68527	532822	253,527	660,822				
NHDES Staff Labor		30,935		30935		61,870			0	0	National Grid	In-Kind		
Lank Excavation														
Equipment Rental		18,480		18480		36,960					National Grid	In-Kind		
NHDES														
Equipment Rental		1,785		1785		3,570					National Grid	In-Kind		
Sum-Co Eco Contracting		12,800		12800		25,600					National Grid	In-Kind		
Other														
insert items/rows					0	0			0	0				
Total	64,000	64,000	121,000	64,000	185,000	128,000	68,527	532,822	253,527	660,822				

1 The non-federal match amount being applied to this GOMC-NOAA Partnership award. The amount of match stated in your contract must be fully expended / accumulated and documented at the completion of your GOMC-NOAA Partnership project.

2 "Other sources" are contributions of support for this project phase not being applied as match to this GOMC-NOAA award.

3 Types include: "cash", "in-kind" or others. See instructions for how to properly document match in the final report.

4 Show the hourly rate ($) and hours contributed to your project up to the end of the reporting period.

GOMC-NOAA grant monies have been fully expended and documentation was provided in earlier reports.

The non-federal match amount was contributed in-kind by National Grid for the relocation and replacement of the gas line crossing Black Brook downstream of the former dam site. The full match dollars exceed the reported match by $85,539.00. The remaining dollars will be used to leverage other federal monies received, if required. The match letter provided by National Grid is included with this report.

Maxwell Pond Dam Removal & Black Brook Restoration

Pre-Construction

Maxwell Pond Dam Removal & Black Brook Restoration

Construction

Maxwell Pond Dam Removal & Black Brook Restoration

Construction

Maxwell Pond Dam Removal & Black Brook Restoration

Post-Construction

Maxwell Pond Dam Removal & Black Brook Restoration

Pre-Construction

Maxwell Pond Dam Removal & Black Brook Restoration

Construction

Maxwell Pond Dam Removal & Black Brook Restoration

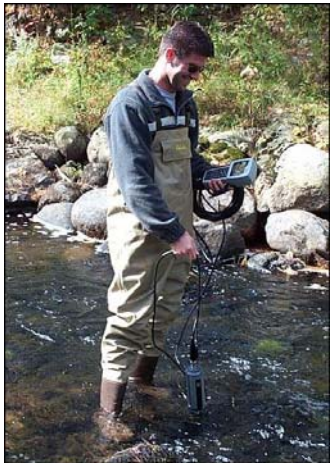
Construction

Maxwell Pond Dam Removal & Black Brook Restoration

Field Monitoring Activities

Maxwell Pond Dam Removal & Black Brook Restoration

Field Monitoring Activities



The Maxwell Pond Dam on Black Brook to be Removed

Wednesday, February 25, 2009

Reporters are invited to view the removal that will reduce safety hazards, improve water quality, allow for fish passage, and increase recreational opportunities

Contacts:
Steve Landry, NH DES, 603-271-2969
Chuck Deprima, City of Manchester, 603-624-6565
Brian Graber, American Rivers, 413-585-5896
Monica Allen, NOAA, 301-713-2370

Manchester, NH — The City of Manchester is taking an important step toward fostering a more resilient community this week as construction begins on the removal of the Maxwell Pond Dam on Black Brook. Reporters are invited to view the removal of the spillway and talk to dam removal experts on Monday, March 2 (details are at the end of this release.)

Faced with an aging dam that was exacerbating local flooding and threatening critical infrastructure, City leaders joined forces with the New Hampshire Department of Environmental Services and an array of partners to craft a comprehensive restoration project that will not only eliminate a safety hazard but will also restore more than seven miles of habitat for migratory fish and improve water quality in Black Brook. State scientists expect that the improvement will allow Black Brook, a tributary of the Merrimack River, to be removed from New Hampshire's 303(d) list of impaired waters. Maxwell Pond is currently on the list because it does not adequately support diverse aquatic life due to its low level of dissolved oxygen, which aquatic life needs to survive.

Formerly owned by A.H. Maxwell of the Manchester Coal & Ice Company, the impoundment was once the source of what some considered the purest ice in Manchester. Unfortunately, over time this once thriving stream has become a degraded, stagnant impoundment that supports only a few warm water fish species. "Removing the Maxwell Pond Dam will allow Black Brook to flow swifter and cleaner, greatly improving habitat for alewife, American eel, blueback herring, Atlantic salmon, and other migratory fish native to this area," said Eric Hutchins of the National Oceanic and Atmospheric Administration (NOAA) Restoration Center.

The dam also aggravated flooding. During past flood events, water has risen over the dam and flooded Front Street. As a result, several local businesses were forced to shut down and suffer losses. Flooding at this site has also threatened to undermine the busy Front Street Bridge. "The situation at the Maxwell Pond Dam had the potential to become quite dire as each flood also threatened the stability of a gas main spanning the channel," said Jim Gallagher, Chief of the Dam Bureau for the New Hampshire Department of Environmental Services. "Thankfully, National Grid went above and beyond to relocate the gas main as part of this project, ensuring greater security for this vital component of Manchester's infrastructure."

The decision to remove the dam is about more than making Black Brook and Manchester safer. The surrounding community will also benefit in other ways. "By removing this dam, we are breathing new life back into Black Brook and Blodgett Park," said Chuck Deprima, Director of Parks and Recreation for the city of Manchester. As part of the restoration project, the city of Manchester plans a major revitalization of the surrounding park, adding an educational kiosk and refurbishing the trail system. "This project will provide better access for fishing and kayaking and help reconnect people to the outdoors. Soon, a healthy Black Brook will be a source of pride for the community," added Deprima. To learn more about Manchester's work on this project, please visit: http://www.manchesternh.gov/website/Departments/EnvironmentalProtection/SEPP/PondRestoration/MaxwellPond/tabid/1189/Default.aspx.

Manchester is not the only community facing the challenges presented by aging infrastructure. By 2020 more than 85 percent of our nation's dams will be older than 50 years of age, their average life expectancy. Communities across New Hampshire and the country are realizing the multiple benefits—improved water quality, revitalized fisheries, new recreational opportunities, increased real estate values, and recovered land suitable for parks and other public use—in removing obsolete dams and restoring natural river function.

"When we tear down old infrastructure like obsolete dams, we build up our natural infrastructure – the streams, wetlands and floodplains that give our communities essential services like clean water, flood protection, and other economic benefits," said Rebecca Wodder, president of American Rivers.

This project would not have been possible without the multitude of partners that provided both financial and technical assistance. Project partners include the City of Manchester, the New Hampshire Department of Environmental Services (NHDES), the New Hampshire Fish and Game Department (NHF&G), the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), the New Hampshire State Conservation Committee, the New Hampshire Corporate Wetlands Restoration Partnership, American Rivers, the Gulf of Maine Council on the Marine Environment, Trout Unlimited, Manchester Fly Fishing Club, Amoskeag Fishways, Fairpoint Communications, National Grid, Aggregate Industries, and Dubois and King, Inc.

Construction is expected to last for three to four weeks and is being led by the New Hampshire Department of Environmental Services Dam Maintenance Section. If you are interested in seeing a major part of the construction, the removal of the spillway, on Monday, March 2, you can visit the site between 10:00 am and 12:00 pm. Parking is available at the E.W. Poore Frame Shop and Art Gallery located across the street from the project site at 531 Front Street. Vehicles should not be parked on the west side of Front Street adjacent to the project area for safety reasons. Stephen Landry, Merrimack Watershed Supervisor for the New Hampshire Department of Environmental Services; Chuck Deprima, Director of Parks and Recreation for the City of Manchester; and Serena McClain, Associate Director of River Restoration Programs at American Rivers, will all be on site to answer questions. For more details, please contact one of the experts listed above.

Black Brook Restoration

Faced with an aging dam that was exacerbating local flooding and threatening critical infrastructure, the City of Manchester partnered with the NH Department of Environmental Services and several project partners to craft a comprehensive restoration project in which the goals are as follows:

- **Alleviate safety hazards** caused by structural problems of the dam;
- **Reduce flooding** caused by waters that could not be contained by the dam;
- **Eliminate** the economic burden of annual fees, maintenance, and repairs.
- **Restore** more than seven miles of habitat for migratory fish and improve water quality in Black Brook; and
- **Remove** Black Brook from the state's 303(d) list of impaired waters. Maxwell Pond was on the list since it did not adequately support diverse aquatic life due to its low level of dissolved oxygen.

Maxwell Pond Dam Removal, March 2009

Upcoming Projects

- **Head's Pond Dam**
  Browns Brook, Hooksett
- **Homestead Woolen Mill Dam**
  Ashuelot River, Swanzey

Restoration In Progress

- **Winnicut River Dam**
  Winnicut River, Greenland

Completed Projects

- **Bearcamp River Dam**
  Bearcamp River, South Tamworth
- **Maxwell Pond Dam**
  Black Brook, Manchester
- **Pearl Lake Brook Dam**
  Pearl Lake Brook, Lisbon
- **Merrimack Village Dam**
  Souhegan River, Merrimack

For More Information

NH Department of Environmental Services
Water Division, Dam Bureau
River Restoration Program
29 Hazen Drive PO Box 95
Concord, NH 03302-0095

Deb Loiselle
River Restoration Coordinator
(603)-271-8870
deborah.loiselle@des.nh.gov

http://des.nh.gov/organization/divisions/water/dam/damremoval

Black Brook, July 2009

The City of Manchester
and the
NH Department of Environmental Services Water Division

Welcome you to the

Maxwell Pond Dam Removal/ Black Brook Restoration Ceremony

November 5, 2009
10:00 a.m.

History of the Maxwell Pond Dam

Maxwell Pond was created by the installation of a dam on Black Brook in 1900. The pond was named for A.D. Maxwell, who owned the Amoskeag Ice Company. Ice harvesting began shortly after the dam was created in 1900 and Maxwell Pond was considered Manchester's best source of pure ice.

Until the late 1950's, Maxwell Pond was also popular for swimming, picnicking, and fishing. In the winter months the pond provided a spot for ice skating, bonfires and hockey games. It was even considered for a secondary municipal water source for the City of Manchester. In the late 1950's and early 1960's Maxwell Pond began to change when upstream land uses began impacting Black Brook.

By 2005, the pond had diminished to a maximum depth of less than four feet. Water quality had severely degraded. Refrigeration technology had left the pond's original purpose obsolete, swimming was no longer possible, and fishing was severely impacted. Flooding and the deteriorating condition of the dam had also become significant safety concerns.

Maxwell Pond Dam, 1910

Agenda

Welcome and Introductions

Jessica Fleming
Parks Planner, City of Manchester

Speakers

Thomas Burack
Commissioner, NHDES

Frank Guinta
Mayor, City of Manchester

Matt Schweisberg,
Acting Chief, Surface Water Branch, U.S. EPA

Stephanie Lindloff
Senior Dir., River Restoration Program, American Rivers

Presentation of Awards

Steve Landry
Merrimack Watershed Supervisor, NHDES

Closing Remarks

Chuck DePrima
Parks & Recreation Interim Dir., City of Manchester

Site Walk

"A river is more than an amenity, it is a treasure."

- Oliver Wendell Holmes

Maxwell Pond Dam, 2006

Project Partners

AGGREGATE INDUSTRIES

American Rivers
Thriving By Nature

The Amoskeag Fishways
Learning and Visitors Center

City of Manchester
Incorporated June 1846

FairPoint communications

Gulf of Maine Council on the Marine Environment

nationalgrid

NHCWRP

New Hampshire Department of Environmental Services

Fish & Game

Live Free or Die
NH SCC
Hampshire

NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

TROUT UNLIMITED

This project was funded, in part, through a Watershed Assistance Grant from the NHDES under Grant no. C-998132404 awarded by the U.S. Environmental Protection Agency. EPA does not endorse any products or commercial services mentioned in this publication.

Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
New Hampshire

Stakeholders Cooperate to Remove Dam and Restore Stream Hydrology

Waterbody Improved

A century-old dam across Black Brook created an impoundment called Maxwell Pond, which was a site for ice harvesting, fishing, swimming and other recreation. Over time, sediment from poorly managed industrial sites accumulated in the pond, which became stagnant and shallow. As a result, the New Hampshire Department of Environmental Services (NHDES) added Maxwell Pond to the 2002 Clean Water Act (CWA) section 303(d) list of impaired waters. Stakeholders restored the pond's water quality by reducing upstream sediment sources and removing the dam. Once Black Brook returned to its free-flowing condition (and Maxwell Pond ceased to exist and was reclaimed as a segment of Black Brook), the dissolved oxygen level rebounded and the brook could once again support its aquatic life designated use. As a result of the improvements, in 2010 NHDES removed the former Maxwell Pond portion of Black Brook from the state's CWA section 303(d) list of impaired waters for dissolved oxygen.

Problem

New Hampshire's Black Brook flows approximately seven miles from its headwaters in the town of Dunbarton to the city of Manchester, where it empties into the Merrimack River. More than 100 years ago (circa 1900), Maxwell Pond Dam was constructed across Black Brook in northwest Manchester to create an ice-harvesting pond (Figure1). When first created, Maxwell Pond included 5.5 acres of open water and had a maximum depth of 12 feet.

In the late 1950s, a cement processing plant/sand and gravel company began operating in the Black Brook watershed upstream of Maxwell Pond. Historically, the company stockpiled materials next to the brook, had poor on-site stormwater controls, and built undersized culverts at road crossings, which caused flooding and exacerbated erosion during storm events. The excessive sediment load from within the watershed was transported in the swift flow of Black Brook and then deposited in Maxwell Pond as the flow decreased within the impoundment.

By 2002 the pond that had once hosted ice harvesting, skating, swimming, fishing and other uses had become severely impaired by sediment accumulation. The maximum water depth had diminished to three feet. Maxwell Pond was warm, supported excessive aquatic plant growth, and had low dissolved oxygen levels. The applicable New Hampshire water quality standard for dissolved oxygen requires that Class B waters achieve a 75 percent minimum

Figure 1. Maxwell Pond Dam on Black Brook in September 2008.

daily average dissolved oxygen saturation and meet a minimum instantaneous concentration of 5.0 milligrams per liter (mg/L). Maxwell Pond data showed that dissolved oxygen levels violated both the dissolved oxygen saturation standard (in 10 of 19 samples) and the dissolved oxygen concentration standard (in 6 of 19 samples). Because the waterbody did not support its aquatic life designated use, NHDES added Maxwell Pond to the state's 2002 CWA section 303(d) list of impaired waters for low dissolved oxygen concentration and dissolved oxygen saturation. As a result of those impairments, along with additional environmental concerns, recent flooding, and other public safety issues, the city of Manchester was compelled to repair or remove the dam.

Project Highlights

Multiple partners began work to restore Black Brook in 2002. Using EPA CWA section 319 funds, Trout Unlimited managed a project that studied the causes of the impairments and considered strategies for watershed restoration (including dam removal). The owner of Aggregate Industries implemented sediment control practices and removed perched, undersized culverts to reduce erosion upstream of the project site.

In 2006 the city of Manchester administered a second CWA section 319-funded project to design and implement the restoration project. The NHDES Dam Maintenance Section began removing the dam in February 2009. By mid-March, Black Brook flowed freely to the Merrimack River for the first time in more than 100 years. Project partners stabilized and replanted slopes in spring 2009 (Figure 2). Additional water quality, vegetation, fish population and physical/hydrological monitoring are ongoing. Partners plan to complete more riparian plantings and additional streambank stabilization activities during 2010.

Figure 2. Same location as Figure 1, showing Black Brook in June 2009 after the dam was removed and natural gas line relocated.

Results

Removing the dam in 2009 drained Maxwell Pond and reestablished the free-flowing condition of Black Brook. Participants in the NHDES Volunteer Lake Assessment Program and Volunteer River Assessment Program monitored dissolved oxygen levels before and after NHDES removed the dam. The data show that the Black Brook riverine assessment unit (NHRIV700060801-05-02) that runs through the former Maxwell Pond site now meets water quality standards for dissolved oxygen (Table 1). If the data had shown continued dissolved oxygen problems at the former Maxwell Pond site, NHDES would have transferred the impairment to Black Brook. However, because the assessment unit now meets water quality standards, NHDES has removed the former Maxwell Pond portion of Black Brook from the state's 2010 CWA section 303(d) list of impaired waters for dissolved oxygen. Black Brook assessment unit NHRIV700060801-05-02 remains on the impaired waters list for mercury, benthic macroinvertebrate bioassessments and pH.

Table 1. Maxwell Pond Data for 2009[1]

Sample date	Former Impoundment Site (01A-BKB)	
	DO (mg/L)	DO Saturation (%)
28 Jun 09	7.60	84.5
23 Jul 09	8.18	87.9
23 Aug 09	7.62	90.2
18 Sep 09	10.55	101.9
26 Sep 09	9.01	84.0

[1] To meet the water quality standards, the dissolved oxygen (DO) concentration must be at least 5 mg/L and the DO saturation must be at least 75 percent.

Partners and Funding

Numerous partners cooperated on the project, including the city of Manchester, local residents, local companies, NHDES and EPA. EPA CWA section 319 funds provided $13,350 for the initial study and $105,000 to administer, plan, document and implement the project. The city of Manchester, in close cooperation with NHDES staff, provided project coordination. The city contributed $40,000. In addition to the CWA section 319 grants, federal support came from a $50,000 American Rivers/National Oceanic and Atmospheric Administration (NOAA) grant, $10,000 from Trout Unlimited/NOAA funds, and $64,000 from Gulf of Maine Council/NOAA funds. State project funding included a $6,000 New Hampshire Corporate Wetlands Restoration Partnership grant and $25,000 from the New Hampshire State Conservation Committee. Fairpoint Communications provided $46,450, and National Grid provided $149,539 in services to relocate natural gas and telephone lines affected by removal of the dam structure. Aggregate Industries provided $150,000 in services to correct upstream sediment contribution and fish passage obstructions. Many others, including local residents, representatives from New Hampshire Fish and Game, Dubois & King Inc., Amoskeag Fishways, and state-funded NHDES staff, provided in-kind services (worth $26,000).

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-10-001W
September 2010

For additional information contact:

Barbara McMillan
Watershed Outreach Coordinator
New Hampshire Department
of Environmental Services
603-271-7889 • Barbara.mcmillan@des.nh.gov

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

April 26, 2010

City of Manchester
Department of Parks, Recreation and Cemeteries
Attn: Charles Deprima
625 Mammoth Road
Manchester, NH 03104

Project: **Maxwell Pond/Black Brook Dam Removal Project, Manchester, NH - PD #150.07**

Dear Mr. Deprima:

The Department of Environmental Services, Dam Bureau has completed the Maxwell Pond Dam Removal per the Memorandum of Agreement between the Department of Environmental Services and the City of Manchester (see attached). The Memorandum of Agreement was signed by Mayor Guinta on December 3, 2008 and approved by the State Governor & Council on January 14, 2009.

Listed below is a final summary of expenses provided by the Department of Environmental Services, Dam Bureau.

FINAL SUMMARY OF EXPENSES

DESCRIPTION	CHARGES	CREDITS	ACCOUNT BALANCE
DES Staff Labor through 5/31/09	$30,934.52		$30,934.52
Aggregate/Materials	$6,358.25		$37,292.77
Misc. Expenses	$311.18		$37,603.95
Nelson Welding Torch Cutting	$650.00		$38,253.95
United Rental - Equipment Rental	$9,541.73		$47,795.68
Lank Excavation - Equipment Rental	$18,480.00		$66,275.68
DES Own Forces Equipment Rental	$8,922.39		$75,198.07
Payment from City of Manchester 08/02/09		$75,198.07	$0.00
DES Staff Labor 6/1/09 - 11/30/09	$4,280.08		$4,280.08
DES Own Forces Equipment Rental	$392.32		$4,672.40
Waste Inc.	$175.00		$4,847.40

Please make your check payable in the amount of $4,847.40 to the New Hampshire Department of Environmental Services, Dam Bureau, Attn: Julie Lockwood.

If there are questions concerning this summary of expenses, please contact me at (603) 271-4167.

Sincerely,

Dale Guinn, P.E.
Senior Project Engineer
Dam Bureau

cc: DES - Accounts Payable
Gail Timmins, DES
Julie Lockwood, DES

June 11, 2009

City of Manchester
Frank C. Guinta, Mayor

Manchester, NH

Project: **Maxwell Pond/Black Brook Dam Removal Project, Manchester, NH**
Dam No. 150.07

Dear Mayor Guinta:

The Department of Environmental Services, Dam Bureau has substantially completed the Maxwell Pond Dam Removal per the Memorandum of Agreement between the Department of Environmental Services and the City of Manchester (see attached). The Memorandum of Agreement was signed by you on December 3, 2008 and approved by the State Governor & Council on January 14, 2009. The work remaining to be completed is survey work associated with new river cross-sections and longitudinal survey work along the newly developing river channel. Because most of the remaining work is better completed in the driest conditions this work is scheduled for later this summer.

Listed below is a partial summary of expenses provided by the Department of Environmental Services, Dam Bureau.

PARTIAL SUMMARY OF EXPENSES - thru May 31, 2009

DESCRIPTION	CHARGES
DES Staff Labor	$30,934.52
Aggregate/Materials	$6,358.25
Misc. Expenses	$311.18
Nelson Welding Torch Cutting	$650.00
United Rental - Equipment Rental	$9,541.73
Lank Excavation - Equipment Rental	$18,480.00
DES Equipment Rental	$8,922.39
Total:	$75,198.07

Please make your **check payable in the amount of $75, 198.07 to the New Hampshire Department of Environmental Services, Attn: Julie Lockwood.**

If there are questions concerning this summary of expenses, please contact me at (603) 271-4167.

Sincerely,

Dale Guinn, P.E.
Senior Project Engineer
Dam Bureau

cc: Gail Timmins, DES
Julie Lockwood, DES

SUMCO
ECO-CONTRACTING

Bill To
Parks, Recreation & Cemetery Dept. 625 Mammoth Road Manchester, NH 03104

Invoice

Date	Invoice #
5/6/2009	273

P.O. No.	Terms	Project
956745	Net 30	Maxwell Pond

Quantity	Description	Rate	Amount
	Slope Stabilization & Plantings Maxwell Pond & Black Brook Dam Manchester, NH		
	Work completed during the period 4/29/09 - 5/1/09	16,177.50	16,177.50
	[See attached Schedule of Values]		
	We certify that payments for all materials and labor are on a current basis. Richard Sumner, Manager		
		Total	**$16,177.50**

16 Front Street - Suite 206, Salem, MA 01970 • T: 978.744.1515 F: 815.572.5022 • info@sumcoeco.com • www.sumcoeco.com

CONTINUATION SHEET

PAGE 1 OF 1 PAGES

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing
Contractor's signed Certification is attached.

APPLICATION NUMBER: 01
APPLICATION DATE: 5/6/2009
PERIOD FROM: 4/29/2009
TO: 5/1/2009
P.O. NUMBER: 956745

Project Name: Maxwell Pond Dam Removal - Slope Stabilization & Planting

A	B	C	D	E	F		G		H
				WORK COMPLETED					
ITEM No.	DESCRIPTION OF WORK	SCHEDULED VALUE (EACH)	SCHEDULED # UNITS	Previous Application	This Application # Units	This Application Total	TOTAL COMPLETED AND STORED TO DATE (E+F)	% (G / CxD)	BALANCE TO FINISH (CxD - G)
1	Erosion control blanket (NAG S150BN)	$3.00	1,600		1,600	$4,800.00	$4,800.00	100%	$0.00
2	NE Warm Season Grass Mix seeding	$0.06	11,500		11,500	$690.00	$690.00	100%	$0.00
3	Maple & Oak Trees: 3"-3.5" caliper	$785.00	6		6	$4,710.00	$4,710.00	100%	$0.00
4	Native Trees: 2'-4'	$32.00	45		45	$1,440.00	$1,440.00	100%	$0.00
5	Native Shrubs: 12"-24"	$32.00	75		75	$2,400.00	$2,400.00	100%	$0.00
6	Native Shrubs: Tubelings	$5.70	375		375	$2,137.50	$2,137.50	100%	$0.00
	TOTALS =	$16,177.50		$0.00		$16,177.50	$16,177.50	100%	$0.00

National Grid
40 Sylvan Road
Waltham, MA 02451

October 7, 2009

RE: Maxwell Pond - Black Brook Dam Removal Project

Charles Deprima
City of Manchester
Parks, Recreation & Cemeteries
625 Mammoth Road
Manchester, NH 03104

Dear Chuck,

As part of the Black Brook Dam Removal Project, National Grid removed approximately 125 feet of existing 6 inch coated steel natural gas main. National Grid installed, in a new location closer to the roadway, approximately 125 feet of 8 in coated steel natural gas main, with a 10 in sleeve over the waterway. This construction took place between February 2, 2009 and March 17, 2009.

National Grid incurred costs associated with the project as listed below:

Labor:	$127,166.88
Materials:	$22,372.24
Total	$149,539.12

If you have any additional questions or concerns please do not hesitate to call me.

Best wishes,

Melissa F. Owens
Project Engineering & Design
(781) 907-2845